CLAIMS

What is claimed is:

1. A method of controlling transmitter power in a wireless communication system which combines multiple channels of user data at independent rates, at least one of which varies over time, into a signal having a rate N(t) where N(t) is a function of the rates of the multiple channels which are combined for transmission, in which the combined multichannel signal having rate N(t) is converted into a transmission data signal having a faster rate M(t) for transmission by a transmitter and in which the transmission power is adjusted on a relatively slow basis based on quality of data received by a receiver of the transmitted data characterized by:

determining the transmitter scale factor as a function of N(t)/M(t) such that a change in the data rate in the multiple channels or the rate of the transmission data signal is compensated in advance of a quality of data based adjustment associated with such data rate change.

2. The method of claim 1 wherein transmitter power is controlled by an open loop system where the transmitter:

receives from the receiver a reference signal, reference signal power data, measured interference power data, and target signal to interference ratio (SIR) data which SIR data is based on relatively slowly collected received signal quality data,

measures the reference signal to determine received reference signal power,

computes a path loss based on the received reference signal power data and the determined reference signal power, and

computes the scale factor based on the computed path loss, the received measured interference power data, the target SIR data and $\sqrt{(N(t)/M(t))}$.

3. The method of claim 2 wherein the combined multichannel signal having rate N(t) is converted into the transmission data signal having the faster rate M(t) by repeating selected data bits whereby the energy per bit to noise spectrum density ratio is increased in the transmission data signal.

4. The method of claim 1 wherein transmitter power is controlled by a closed loop system where the transmitter utilizes step up/down data generated by the receiver and computes the scale factor based on the step up/step down data and $\sqrt{(N(t)/M(t))}$.

5. The method of claim 4 wherein the combined multichannel signal having rate N(t) is converted into the transmission data signal having the faster rate M(t) by repeating selected data bits whereby the energy per bit to noise spectrum density ratio is increased in the transmission data signal.

6. The method of claim 4 wherein the step up/down data is generated by the receiver by combining measured interference power data of the signal received

from the transmitter with target signal to interference ratio (SIR) data based at least in part on relatively slowly collected received signal quality data.

7. The method of claim 6 wherein the target SIR data is computed by multiplying a nominal target SIR data based on relatively slowly collected received signal quality data by a factor N(t)/M(t) so that the target SIR data is quickly adjusted when a change in data rate occurs.

8. The method of claim 7 wherein the combined multichannel signal having rate N(t) is converted into the transmission data signal having the faster rate M(t) by repeating selected data bits whereby the energy per bit to noise spectrum density ratio is increased in the transmission data signal.

9. The method of claim 1 wherein the combined multichannel signal having rate N(t) is converted into the transmission data signal having the faster rate M(t) by repeating selected data bits whereby the energy per bit to noise spectrum density ratio is increased in the transmission data signal.

10. A transmitter for a wireless communication system which combines multiple channels of user data at independent rates, at least one of which varies over time, into a signal having a rate N(t) where N(t) is a function of the rates of the multiple channels which are combined for transmission, in which the combined

multichannel signal having rate N(t) is converted into a transmission data signal having a faster rate M(t) for transmission and in which transmission power is adjusted on a relatively slow basis by applying a scale factor to the transmitter power based on quality of data received by a receiver of the transmitted data, the transmitter including a data signal rate converter which increase the data rate of combined multiple channel data N(t) to a higher data transmission rate M(t) and a processor for computing a transmission power scale factor based in part on data generated by the receiver related to quality of data received characterized in that

said data signal rate converter is associated with said processor such that said processor computes the transmission power scale factor as a function of N(t)/M(t) whereby a change in the data rate in the multiple channels or the rate of the transmission data signal are compensated in connection with real time transmission in advance of a receiver quality of data based adjustment associated with such data rate changes.

11. The transmitter of claim 10 wherein said data signal rate converter converts the combined multichannel signal having rate N(t) into the transmission data signal having the faster rate M(t) by repeating selected data bits whereby the energy per bit to noise spectrum density ratio is increased in the transmission data signal.

12. The transmitter of claim 10 having an open loop power control system where the transmitter receives from the receiver of the transmitted data: a reference

signal, reference signal power data, measured interference power data, and target signal to interference ratio (SIR) data which SIR data is based on relatively slowly collected received signal quality data, further characterized by:

a signal measuring device which measures received reference signal power,

path loss processing circuitry for computing a path loss based on the received reference signal power data and the measured received reference signal power, and

said processor computes the transmission power scale factor based on the computed path loss, the received measured interference power data, the target SIR data and $\sqrt{(N(t)/M(t))}$.

13. The transmitter of claim 12 wherein said data signal rate converter converts the combined multichannel signal having rate N(t) into the transmission data signal having the faster rate M(t) by repeating selected data bits whereby the energy per bit to noise spectrum density ratio is increased in the transmission data signal.

14. The transmitter of claim 10 having a closed loop power control system where the transmitter receives step up/down data from the receiver of the transmitted data wherein said processor computes the transmission power scale factor based on the received step up/step down data and $\sqrt{(N(t)/M(t))}$.

15. The transmitter of claim 14 wherein said data signal rate converter converts the combined multichannel signal having rate N(t) into the transmission data

signal having the faster rate M(t) by repeating selected data bits whereby the energy per bit to noise spectrum density ratio is increased in the transmission data signal.

16. A method of controlling transmitter power in a wireless communication system which combines multiple channels of user data at independent rates, at least one of which varies over time, into a signal having a rate N(t) where N(t) is a function of the rates of the multiple channels which are combined for transmission, in which the combined multichannel signal having rate N(t) is converted into a transmission data signal having a faster rate M(t) for transmission by a transmitter and in which the transmission power is adjusted on a relatively slow basis based on quality of data received by a receiver of the transmitted data characterized by:

determining the transmitter scale factor as a function of N(t)/M(t) such that a change in the data rate in the multiple channels or the rate of the transmission data signal is compensated in advance of a quality of data based adjustment associated with such data rate change.

17. The method of claim 16 wherein the combined multichannel signal having rate N(t) is converted into the transmission data signal having the faster rate M(t) by repeating selected data bits whereby the energy per bit to noise spectrum density ratio is increased in the transmission data signal.

18. A method of controlling transmitter power in a wireless communication system in which user data is processed as a multirate signal having a rate N(t) where N(t) is a function of time, in which the user data signal having rate N(t) is converted into a transmission data signal having a faster rate M(t) for transmission and in which transmitter power is controlled by a closed loop system where the transmission power is adjusted by applying a scale factor in response to step up/down data generated by a receiver of the transmitted data, the step up/down data being based in part on relatively slowly collected quality of data received by characterized by:

determining step up/down data as a function of N(t)/M(t) such that a change in the user data signal rate or the data rate of the transmission data signal is compensated for in advance of a quality of data based adjustment associated with such a data rate change.

19. The method of claim 18 wherein the user data signal having rate N(t) is converted into the transmission data signal having a faster rate M(t) by repeating selected data bits whereby the energy per bit to noise spectrum density ratio is increased in the transmission data signal.

20. The method of claim 18 wherein the step up/down data is generated by the receiver by combining measured interference power data of the signal received from the transmitter with target signal to interference ratio (SIR) data which is computed by multiplying nominal target SIR data, based on relatively slowly collected

received signal quality data, by a factor N(t)/M(t) so that the target SIR data is quickly adjusted when a change in data rate occurs.

21. The method of claim 20 wherein the user data signal having rate N(t) is converted into the transmission data signal having a faster rate M(t) by repeating selected data bits whereby the energy per bit to noise spectrum density ratio is increased in the transmission data signal.

22. The method of claim 20 wherein the transmitter computes the scale factor based on the received step up/down data and $\sqrt{(N(t)/M(t))}$.

23. The method of claim 18 wherein the transmitter computes the scale factor as a function of the received step up/down data and N(t)/M(t).

24. The method of claim 23 wherein the user data signal having rate N(t) is converted into the transmission data signal having a faster rate M(t) by repeating selected data bits whereby the energy per bit to noise spectrum density ratio is increased in the transmission data signal.

25. The method of claim 24 wherein the transmitter computes the scale factor based on the received step up/down data and $\sqrt{(N(t)/M(t))}$.

26. A closed loop transmission power control system for a wireless communication system in which user data is processed as a multirate signal having a rate N(t) where N(t) is a function of time, in which the user data signal having rate N(t) is converted into a transmission data signal having a faster rate M(t) for transmission and in which the transmission power is adjusted by applying a scale factor in response to step up/down data, the system having a receiver which receives the M(t) rate transmission data signal and generates the step up/down data, the receiver including a data signal rate converter which decreases the data rate of received transmission data M(t) to produce a user data signal having the lower data rate N(t), a data quality measuring device for measuring the quality of data of the user data signal, and circuitry for computing step up/down data based in part on the measured quality of data of the user data signal characterized in that:

said data signal rate converter is associated with said circuitry to provide rate data such that said circuitry computes step up/down data as a function of N(t)/M(t) such that a change in the user data signal rate or the rate of the transmission data signal are compensated in connection with real time reception in advance of a quality of data based adjustment associated with such data rate change.

27. The closed loop system of claim 26 further characterized by a transmitter having a data signal rate convertor which converts the user data signal having rate N(t) into the transmission data signal having a faster rate M(t) by repeating selected data

bits whereby the energy per bit to noise spectrum density ratio is increased in the transmission data signal.

28. The closed loop system of claim 26 wherein the receiver includes an interference measuring device for measuring the power of an interference signal received with the M(t) rate transmission data signal, and said data quality measuring device outputting a nominal target SIR data based on relatively slowly collected received data quality data, further characterized in that:

said circuitry computes the step up/down data by combining measured interference power data of the signal received from the transmitter with target signal to interference ratio SIR data which is computed by multiplying the nominal target SIR data by a factor N(t)/M(t) so that the target SIR data is quickly adjusted when a change in data rate occurs.

29. The closed loop system of claim 26 further characterized by a transmitter having a data signal rate convertor which converts the user data signal having rate N(t) into the transmission data signal having a faster rate M(t) by repeating selected data bits whereby the energy per bit to noise spectrum density ratio is increased in the transmission data signal.

30. The closed loop system of claim 29 wherein the transmitter includes a processor which computes the scale factor based on the step up/down data and $\sqrt{(N(t)/M(t))}$.

31. The closed loop system of claim 26 further characterized by a transmitter having a processor which computes the scale factor as a function of the step up/down data and $N(t)/M(t)$.

32. The closed loop system of claim 31 further characterized by a transmitter having a data signal rate convertor which converts the user data signal having rate $N(t)$ into the transmission data signal having a faster rate $M(t)$ by repeating selected data bits whereby the energy per bit to noise spectrum density ratio is increased in the transmission data signal.

33. The method of claim 31 wherein the transmitter processor computes the scale factor based on the step up/down data and $\sqrt{(N(t)/M(t))}$.